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EXAMINER

MATTIS, JASON E

ART UNIT PAPER NUMBER

2665

DATE MAILED: 02/20/2004

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/046,572

Applicant(s)

FOSTER ET AL.

Examiner

Jason E Mattis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20,23-32 and 34-41 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20, 23-32, 34-41 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. This action is in reference to Applicant's Amendment A filed on 1/26/04. Claims 21, 22, and 33 have been cancelled. Claims 1-20, 23-32, and 34-41 are pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 4, 9, 11 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Filgate (U.S. Pat. 6292488).

With respect to claim 1, Filgate discloses a method in a switch, a bridge, for avoiding deadlock while a connection is being established through the switch, bridge **(See the abstract of Filgate for reference to the method of resolving deadlocks in a bridge)**. Filgate also discloses prompting a recovery mechanism 355 when a deadlock is detected **(See column 5 lines 35-64 and item 355 in Figure 3 of Filgate for reference to prompting a recovery mechanism)**. This step of prompting a recovery mechanism 355 can be interpreted to be a step for receiving data indicating that a port is to be part of a conflicting connection. Since the method of Filgate detects a deadlock, it is inherent that the conflicting port is already part of a connection being

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established. Filgate further discloses using bridge request priority, which can be interpreted to be connection priority, to resolve the deadlock (**See column 6 line 50 to column 7 line 3 of Filgate for reference to bridge priority**). In the method of Filgate, when the current bridge request has higher priority, the current bridge connection is maintained by establishing this current connection, and when the current bridged request does not have higher priority, request for control of the bridge is terminated and the conflicting bridge request is granted.

With respect to claim 3, Filgate discloses that a time delay value (**See column 6 lines 36-49 of Filgate for reference to the time delay values**), which determines bridge priority, may be pre-programmed into each bridge. In this way, when connection priorities are equal, an identifier of the bridge that sent the connection request is used as a tiebreaker.

With respect to claim 4, Filgate discloses prompting a CPU 320 through a bridge when a conflicting connection resulting in deadlock has been found (**See column 5 lines 35-64 and item 320 in Figure 3 of Filgate for reference to prompting a CPU**). This step of prompting a CPU 320 through a bridge can be interpreted to be a step for sending data through a partially built connection indicating that the current connection cannot be established.

With respect to claim 9, Filgate discloses a computer system using communication gateway devices, such as bridges (**See the abstract of Filgate for reference to a computer system**). The computer system of Filgate is a switching system, which inherently establishes connection through ports. Filgate also discloses

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prompting a recovery mechanism 355 when a deadlock is detected (**See column 5 lines 35-64 and item 355 in Figure 3 of Filgate for reference to prompting a recovery mechanism**). The recovery mechanism 355 can be interpreted to be a component that receives a communication at a port indicating that the port is to be part of a conflicting connection established through the device. Filgate further discloses that the recovery mechanism 355 maintains the existing bridge request, or existing connection, by establishing this existing connection, when the existing bridge request has a higher priority than the conflicting bridge request, or conflicting connection, and terminates the existing bridge request, when the conflicting bridge request has a higher priority (**See column 6 line 50 to column 7 line 3 of Filgate for reference to the process carried out by the recovery mechanism**).

With respect to claim 11, Filgate discloses that a time delay value (**See column 6 lines 36-49 of Filgate for reference to the time delay values**), which determines bridge priority, may be pre-programmed into each bridge. In this way, the existing connection has the same priority as the conflicting connection, identifiers of the bridges that sent the communications is used as a priority tiebreaker.

With respect to claim 12, Filgate discloses prompting a CPU 320 through a bridge when a conflicting connection resulting in deadlock has been found (**See column 5 lines 35-64 and item 320 in Figure 3 of Filgate for reference to prompting a CPU**). This step of prompting a CPU 320 through a bridge can be interpreted to be a component that sends a communication through the existing connection indicating that the connection cannot be established.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 10, 20, 23, 24, 29, 32, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Filgate in view of Yasuda et al. (U.S. Pat. 5892923).

With respect to claims 2 and 10, Filgate does not disclose that the priority of a connection is based on priority of data to be transmitted through the connection.

With respect to claim 20, Filgate discloses a method for resolving deadlocks in a computer system, which can be interpreted to include a routing device, while connections are being established through the system (**See the abstract of Filgate for reference to this method**). Filgate also discloses a method of prompting a recovery mechanism 355 when a deadlock is detected (**See column 5 lines 35-64 and item 355 in Figure 3 of Filgate for reference to prompting a recovery mechanism**). This step of prompting a recovery mechanism 355 can be interpreted to be a step for receiving data indicating that a port is to be part of a new connection to be established through the routing device. Filgate further discloses a method to terminate a current bridge request, or current connection, and establish a new bridge request, or new connection (**See column 6 line 50 to column 7 lines 3 of Filgate for reference to this method**).

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Filgate further discloses using bridge request priority, which can be interpreted to be connection priority, to resolve the deadlock (**See column 6 line 50 to column 7 line 3 of Filgate for reference to bridge priority**). In the method of Filgate, when the current bridged request does not have higher priority, request for control of the bridge is terminated and the new bridge request is granted. Filgate does not disclose that the priority of a connection is based on priority of communications to be transmitted through the connection.

With respect to claim 23, Filgate also discloses a method where a time delay value (**See column 6 lines 36-49 of Filgate for reference to the time delay values**), which determines bridge priority, may be pre-programmed into each bridge. In this way, when connection priorities are equal, an identifier of the bridge that sent the connection request is used as a tiebreaker.

With respect to claim 24, Filgate discloses a method where a CPU 320 is prompted through a bridge when a conflicting connection resulting in deadlock has been found (**See column 5 lines 35-64 and item 320 in Figure 3 of Filgate for reference to prompting a CPU**). This step of prompting a CPU 320 through a bridge can be interpreted to be a step for sending data through a partially built connection indicating that the current connection cannot be established.

With respect to claim 29, Filgate discloses a method with a computer system, which inherently has ports, where a deadlock condition, or conflict, occurs when a current connection and a new connection are to use the same bridges (**See column 2 line 26 to column 3 line 15 of Filgate for reference to the deadlock condition**).

With respect to claim 32, Filgate discloses a computer system and a means for prompting a recovery mechanism 355 when a bridge used in a current connection is also to be used in a conflicting connection (**See column 5 lines 35-64 and item 355 in Figure 3 of Filgate for reference to prompting a recovery mechanism**). This step of prompting a recovery mechanism 355 can be interpreted to be a step for a communication at a port indicating that the port is to be part of a new connection. Filgate further discloses that the recovery mechanism 355 maintains the existing bridge request, or existing connection, by establishing this existing connection, when the existing bridge request has a higher priority than the conflicting bridge request, or conflicting connection, and terminates the existing bridge request, when the conflicting bridge request has a higher priority (**See column 6 line 50 to column 7 line 3 of Filgate for reference to the process carried out by the recovery mechanism**). Filgate does not disclose that the priority of a connection is based on priority of the communication to be transmitted through the connection.

With respect to claim 34, Filgate discloses that a time delay value (**See column 6 lines 36-49 of Filgate for reference to time delay values**), which determines bridge priority, may be pre-programmed into each bridge. In this way, when connection priorities are equal, identifiers of the bridges that sent the communications are used as a priority tiebreaker.

With respect to claim 35, Filgate discloses prompting a CPU 320 through a bridge when a conflicting connection resulting in deadlock has been found (**See column 5 lines 35-64 and item 320 in Figure 3 of Filgate for reference to prompting a**

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CPU). This step of prompting a CPU 320 though a bridge can be interpreted to be a step for sending a communication though the existing connection indicating that he exiting connection cannot be established.

Yasuda et al., in the field of communications, discloses controlling routing connections using message priority, which can be interpreted to be data priority or communication priority (**See column 4 lines 8-17 of Yasuda et al. for reference to this method**). Using message priority to route data has the advantage of making sure that high priority data and communications, for example, time sensitive data, such as voice or video data, is routed with a minimum of interruptions due to deadlock conditions.

It would have been obvious to one of ordinary skill in the art at the time of the invention, when presented with the work of Yasuda et al., to apply the use of data and communication priority, as suggested by Yasuda et al., to the deadlock resolution method and system of Filgate, with the motivation being to make sure that high priority data and communications, for example, time sensitive data, such as voice or video data, is routed with a minimum of interruptions due to deadlock conditions.

6. Claims 5, 13, 25, 30, and 36 rejected under 35 U.S.C. 103(a) as being unpatentable over Filgate in view of Srinivasan et al. (U.S. Pat. 6304549).

With respect to claims 5, 13, 25, 30, and 36 Filgate does not discloses attempting to establish the connections, for example, the lower priority connection, through another equivalent port, or bridge.

Srinivasan et al., in the field of communications, discloses attempting a different route when a connection is unsuccessful (**See column 11 lines 29-39 of Srinivasan et al. for reference to attempting a different route**). This method of attempting a different route is equivalent to attempting to establish connections, for example, the lower priority connection, through another bridge. This method has the advantage of taking less time to route the data of the lower priority connection because, if a connection through a different route is used, the data can be transferred without having to wait until the data of the conflicting connection has finished being transferred.

It would have been obvious to one of ordinary skill in the art at the time of the inventions, when presented with the work of Srinivasan et al., to apply the method of attempting to find a different route for connections, as suggested by Srinivasan et al., to the deadlock resolution method and system of Filgate, with the motivation being to take less time to route the data of the lower priority connection because, if a connection through a different route is used, the data can be transferred without having to wait until the data of the conflicting connection has finished being transferred.

7. Claims 6, 14, 26, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Filgate in view of Ogimoto et al. (U.S. Pat. 6032205).

With respect to claims 6, 14, 26, and 37, Filgate does not disclose that the data or communication is a start-of-connection frame.

Ogimoto et al., in the field of communications, discloses data being processed with a priority controller 113 through header decode circuits 109 and 111 in a switching

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environment based on leading words in the messages (**See column 8 lines 7-20 and items 109, 111, and 113 in Figure 2 of Ogimoto et al. for reference to data being processed based on leading words**). The leading words of Ogimoto et al. initiate a transmission permit signal, which can be interpreted to be a start of connection frame. This method has the advantage of encoding routing and priority in the data so that connection paths can be requested and priorities can be determined.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Ogimoto et al., to apply the use of leading words, as suggested by Ogimoto et al., to the deadlock resolution method and system of Filgate, with the motivation being to encode routing and priority in the data so that connection paths can be requested and priorities can be determined.

8. Claims 7, 8, 15, 16, 27, 28, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Filgate in view of Latif et al. (U.S. Pat. 6400730).

With respect to claims 7, 8, 15, 16, 27, 28, 38, and 39, Filgate does not specifically disclose switches being Fibre Channel and InfiniBand compatible.

Latif et al., in the field of communications, discloses a switch comprising any combination of Fibre Channel and InfiniBand ports (**See column 4 lines 13-39 of Latif et al. for reference to the Fibre Channel and InfiniBand ports**). Making the switch Fibre Channel and InfiniBand compatible has the advantage of allowing the switch to process data using the Fibre Channel standard and the InfiniBand standard.

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It would have been obvious for one of ordinary skill in that art at the time of the invention, when presented with the work of Latif et al., to apply a Fibre Channel and InfiniBand compatible switch, as suggested by Latif et al., to the deadlock resolution method and system of Filgate, with the motivation being to allow the switching system to process data using the Fibre Channel standard and the InfiniBand standard.

9. Claims 17, 18, 19, 31, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Filgate in view of Liew (U.S. Pat. 5327552).

With respect to claims 17, 18, 19, 31, 40, and 41, Filgate differs from these claims in that the deadlock resolution method and device of Filgate is applied to a computer system and does not specifically disclose that the device is a routing device, switch, an interconnect fabric module, and node.

Liew, in the field of communications, discloses a method and device for correcting routing errors, including a method for deadlock prevention, for use with a routing device, a switch, an interconnect fabric module, and a node (**See column 1 lines 7-24 of Liew for reference to the use of a deadlock prevention method with a routing device, a switch and a node**). Including a deadlock prevention method in a routing device, a switch, an interconnect fabric module, and a node has the advantage of applying the method to different types of switching networks, rather than just to a computer network.

It would have been obvious for one of ordinary skill in that art at the time of the invention, when presented with the work of Liew, to apply a routing device, a switch, an

interconnect fabric module, and a node, as suggested by Liew, to the deadlock resolution method and system of Filgate, with the motivation being to use the deadlock resolution method and device in with different types of switching networks.

Response to Arguments

10. The amendments to the drawings filed with Amendment A on 1/26/04 are sufficient to overcome the previous drawing objections and has been entered in the file.

11. Applicant's arguments filed 1/26/04 have been fully considered but they are not persuasive.

In response to the Applicant's argument that:

"Filgate teaches that once a deadlock occurs, both nodes drop the connection and attempt to reconnect. Col. 4, lines 20-32; see also Col. 5, lines 47-50. This is different than the present claimed invention which determines if a "current connection has a higher priority than the conflicting connection, [and] maintaining the current connection." See Claim 1 (emphasis added). In other words, the claimed invention keeps a connection with one of the conflicting nodes, while a priority determination is made. The Filgate patent does not maintain a connection but simply drops both connections and has them reconnect at a later time." (See page 11 lines 15-21 of Applicant's amendment)

the examiner respectfully disagrees with the Applicant's assertion. The examiner believes that the Filgate reference does read on "maintaining the current connection",

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because the current connection is the connection established by the bridge of Filgate when the current connection has a higher priority than the conflicting connection. The claim language of "maintaining the current connection" does not imply a limitation that the invention "keeps a connection with one of the conflicting nodes, while priority determination is made". Since this extra limitation was not included in the claims, either originally or by amendment, the examiner believes that the Filgate reference does read on the claimed limitation of "maintaining the current connection".

In response to the Applicant's argument that:

"In general, Yasuda teaches nothing more than including a priority indication in a message packet. The priority information can be used by a switch to route the message packet through the network. There is no indication in Yasuda that the priority indication may be used to control whether or not a connection should be made or be disconnected in favor of another connection. Therefore, there is no suggestion to make a combination of Yasuda with Filgate the Examiner's

rejection is improper." (See page 12 lines 5-10 of Applicant's amendment)

the examiner respectfully disagrees with the Applicant's assertion. The examiner has shown that Yasuda et al. discloses controlling routing connections using message priority, which can be interpreted to be data priority or communication priority (**See column 4 lines 8-17 of Yasuda et al. for reference to this method**). Since part of routing data, which Yasuda et al. discloses that the priority data is used to control, is controlling whether or not a connection should be made or be disconnected in favor of another connection, and because Filgate discloses that it is advantageous to make or

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disconnect a connection in favor of another connection, the examiner believes that there is a sufficient suggestion to make an obviousness combination of Filgate with Yasuda et al.

In response to the Applicant's argument that:

"Filgate teach that both conflicting nodes attempting to use the same port (bridge) are disconnected. Thus, because of this, it would be impossible to combine the teachings of Yasuda with Filgate, since Yasuda teach that the priority is embedded into the message packet. If Yasuda were combined with Filgate, the hypothetical system would never receive the priority information since Filgate disconnects any connections prior to any information transfer. For this reason, it is not obvious to combine Filgate with Yasuda." (See lines 11-16 of Applicant's amendment)

the examiner respectfully disagrees with the Applicant's assertion. Since the priority information for the communication data of Yasuda et al. is embedded in the message packet, the deadlock prevention system of Filgate can get this priority information from the packet at the sending side of the connection, thus it is not necessary that data be sent through the disputed connection for the system to obtain data priority information. The examiner believes that there is a sufficient suggestion to make an obviousness combination of Filgate with Yasuda et al.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason E Mattis whose telephone number is (703) 305-8702. The examiner can normally be reached on M-F 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (703) 305-4798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER